

#### § 146.69

(2) The bottom-hole cement shall be tested by means of an approved radioactive tracer survey annually;

(3) An approved temperature, noise, or other approved log shall be run at least once every five years to test for movement of fluid along the borehole. The Director may require such tests whenever the well is worked over;

(4) Casing inspection logs shall be run whenever the owner or operator conducts a workover in which the injection string is pulled, unless the Director waives this requirement due to well construction or other factors which limit the test's reliability, or based upon the satisfactory results of a casing inspection log run within the previous five years. The Director may require that a casing inspection log be run every five years, if he has reason to believe that the integrity of the long string casing of the well may be adversely affected by naturally-occurring or man-made events;

(5) Any other test approved by the Director in accordance with the procedures in §146.8(d) may also be used.

(e) *Ambient monitoring.* (1) Based on a site-specific assessment of the potential for fluid movement from the well or injection zone, and on the potential value of monitoring wells to detect such movement, the Director shall require the owner or operator to develop a monitoring program. At a minimum, the Director shall require monitoring of the pressure buildup in the injection zone annually, including at a minimum, a shut down of the well for a time sufficient to conduct a valid observation of the pressure fall-off curve.

(2) When prescribing a monitoring system the Director may also require:

(i) Continuous monitoring for pressure changes in the first aquifer overlying the confining zone. When such a well is installed, the owner or operator shall, on a quarterly basis, sample the aquifer and analyze for constituents specified by the Director;

(ii) The use of indirect, geophysical techniques to determine the position of the waste front, the water quality in a formation designated by the Director, or to provide other site specific data;

(iii) Periodic monitoring of the ground water quality in the first aquifer overlying the injection zone;

(iv) Periodic monitoring of the ground water quality in the lowermost USDW; and

(v) Any additional monitoring necessary to determine whether fluids are moving into or between USDWs.

(f) The Director may require seismicity monitoring when he has reason to believe that the injection activity may have the capacity to cause seismic disturbances.

[53 FR 28148, July 26, 1988, as amended at 57 FR 46294, Oct. 7, 1992]

#### § 146.69 Reporting requirements.

Reporting requirements shall, at a minimum, include:

(a) Quarterly reports to the Director containing:

(1) The maximum injection pressure;

(2) A description of any event that exceeds operating parameters for annulus pressure or injection pressure as specified in the permit;

(3) A description of any event which triggers an alarm or shutdown device required pursuant to §146.67(f) and the response taken;

(4) The total volume of fluid injected;

(5) Any change in the annular fluid volume;

(6) The physical, chemical and other relevant characteristics of injected fluids; and

(7) The results of monitoring prescribed under §146.68.

(b) Reporting, within 30 days or with the next quarterly report whichever comes later, the results of:

(1) Periodic tests of mechanical integrity;

(2) Any other test of the injection well conducted by the permittee if required by the Director; and

(3) Any well workover.

#### § 146.70 Information to be evaluated by the Director.

This section sets forth the information which must be evaluated by the Director in authorizing Class I hazardous waste injection wells. For a new Class I hazardous waste injection well, the owner or operator shall submit all the information listed below as part of the permit application. For an existing or converted Class I hazardous waste injection well, the owner or operator shall submit all information listed

below as part of the permit application except for those items of information which are current, accurate, and available in the existing permit file. For both existing and new Class I hazardous waste injection wells, certain maps, cross-sections, tabulations of wells within the area of review and other data may be included in the application by reference provided they are current and readily available to the Director (for example, in the permitting agency's files) and sufficiently identifiable to be retrieved. In cases where EPA issues the permit, all the information in this section must be submitted to the Administrator or his designee.

(a) Prior to the issuance of a permit for an existing Class I hazardous waste injection well to operate or the construction or conversion of a new Class I hazardous waste injection well, the Director shall review the following to assure that the requirements of this part and part 144 are met:

(1) Information required in §144.31;

(2) A map showing the injection well for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number or name and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, mines (surface and subsurface), quarries, water wells and other pertinent surface features, including residences and roads. The map should also show faults, if known or suspected;

(3) A tabulation of all wells within the area of review which penetrate the proposed injection zone or confining zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion and any additional information the Director may require;

(4) The protocol followed to identify, locate and ascertain the condition of abandoned wells within the area of review which penetrate the injection or the confining zones;

(5) Maps and cross-sections indicating the general vertical and lateral limits of all underground sources of drinking water within the area of review, their position relative to the in-

jection formation and the direction of water movement, where known, in each underground source of drinking water which may be affected by the proposed injection;

(6) Maps and cross-sections detailing the geologic structure of the local area;

(7) Maps and cross-sections illustrating the regional geologic setting;

(8) Proposed operating data;

(i) Average and maximum daily rate and volume of the fluid to be injected; and

(ii) Average and maximum injection pressure;

(9) Proposed formation testing program to obtain an analysis of the chemical, physical and radiological characteristics of and other information on the injection formation and the confining zone;

(10) Proposed stimulation program;

(11) Proposed injection procedure;

(12) Schematic or other appropriate drawings of the surface and subsurface construction details of the well;

(13) Contingency plans to cope with all shut-ins or well failures so as to prevent migration of fluids into any USDW;

(14) Plans (including maps) for meeting monitoring requirements of §146.68;

(15) For wells within the area of review which penetrate the injection zone or the confining zone but are not properly completed or plugged, the corrective action to be taken under §146.64;

(16) Construction procedures including a cementing and casing program, well materials specifications and their life expectancy, logging procedures, deviation checks, and a drilling, testing and coring program; and

(17) A demonstration pursuant to part 144, subpart F, that the applicant has the resources necessary to close, plug or abandon the well and for post-closure care.

(b) Prior to the Director's granting approval for the operation of a Class I hazardous waste injection well, the owner or operator shall submit and the Director shall review the following information, which shall be included in the completion report:

(1) All available logging and testing program data on the well;

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(2) A demonstration of mechanical integrity pursuant to § 146.68;

(3) The anticipated maximum pressure and flow rate at which the permittee will operate;

(4) The results of the injection zone and confining zone testing program as required in § 146.70(a)(9);

(5) The actual injection procedure;

(6) The compatibility of injected waste with fluids in the injection zone and minerals in both the injection zone and the confining zone and with the materials used to construct the well;

(7) The calculated area of review based on data obtained during logging and testing of the well and the formation, and where necessary revisions to the information submitted under § 146.70(a)(2) and (3).

(8) The status of corrective action on wells identified in § 146.70(a)(15).

(c) Prior to granting approval for the plugging and abandonment (i.e., closure) of a Class I hazardous waste injection well, the Director shall review the information required in §§ 146.71(a)(4) and 146.72(a).

(d) Any permit issued for a Class I hazardous waste injection well for disposal on the premises where the waste is generated shall contain a certification by the owner or operator that:

(1) The generator of the hazardous waste has a program to reduce the volume or quantity and toxicity of such waste to the degree determined by the generator to be economically practicable; and

(2) Injection of the waste is that practicable method of disposal currently available to the generator which minimizes the present and future threat to human health and the environment.

### § 146.71 Closure.

(a) *Closure Plan.* The owner or operator of a Class I hazardous waste injection well shall prepare, maintain, and comply with a plan for closure of the well that meets the requirements of paragraph (d) of this section and is acceptable to the Director. The obligation to implement the closure plan survives the termination of a permit or the cessation of injection activities. The requirement to maintain and implement an approved plan is directly

enforceable regardless of whether the requirement is a condition of the permit.

(1) The owner or operator shall submit the plan as a part of the permit application and, upon approval by the Director, such plan shall be a condition of any permit issued.

(2) The owner or operator shall submit any proposed significant revision to the method of closure reflected in the plan for approval by the Director no later than the date on which notice of closure is required to be submitted to the Director under paragraph (b) of this section.

(3) The plan shall assure financial responsibility as required in § 144.52(a)(7).

(4) The plan shall include the following information:

(i) The type and number of plugs to be used;

(ii) The placement of each plug including the elevation of the top and bottom of each plug;

(iii) The type and grade and quantity of material to be used in plugging;

(iv) The method of placement of the plugs;

(v) Any proposed test or measure to be made;

(vi) The amount, size, and location (by depth) of casing and any other materials to be left in the well;

(vii) The method and location where casing is to be parted, if applicable;

(viii) The procedure to be used to meet the requirements of paragraph (d)(5) of this section;

(ix) The estimated cost of closure; and

(x) Any proposed test or measure to be made.

(5) The Director may modify a closure plan following the procedures of § 124.5.

(6) An owner or operator of a Class I hazardous waste injection well who ceases injection temporarily, may keep the well open provided he:

(i) Has received authorization from the Director; and

(ii) Has described actions or procedures, satisfactory to the Director, that the owner or operator will take to ensure that the well will not endanger USDWs during the period of temporary disuse. These actions and procedures